

CLAIMS

What is claimed is:

1           1.    A method of tripling a fundamental frequency  
2 comprising:

3           a)    providing a fundamental frequency using a Colpitts  
4 oscillator;

5           b)    using circuitry coupled to the Colpitts oscillator,  
6 doubling the fundamental frequency to provide a twice  
7 frequency signal component;

8           c)    using circuitry coupled to the Colpitts oscillator,  
9 adding a constant to the twice frequency signal component to  
10 provide a constant plus twice frequency term; and,

11          d)    using circuitry coupled to the Colpitts oscillator,  
12 multiplying the constant plus twice frequency term by a  
13 square wave at the fundamental frequency to provide a tripler  
14 output;

15          the phasing and the relative weighting of the twice  
16 frequency component being selected to increase the third  
17 harmonic relative to the fundamental frequency component in  
18 the tripler output.

1           2.    The method of claim 1 wherein the multiplication of  
2 d) is done using a modulator having modulator switches driven  
3 by the fundamental frequency signal.

1           3.    The method of claim 1 wherein the twice frequency  
2 signal component and the constant have approximately the same  
3 magnitude.

1           4.    The method of claim 1 wherein the Colpitts  
2 oscillator is a differential Colpitts oscillator.

1           5.    The method of claim 4 wherein resonant tank  
2 circuits tuned to three times the fundamental frequency are  
3 coupled to the tripler outputs.

1           6.    A method of tripling a fundamental frequency  
2 comprising:

- 3           a)    providing a differential Colpitts oscillator  
4 operating into an inductive load in each leg of the  
5 differential oscillator to provide differential fundamental  
6 frequency signals;
- 7           b)    providing a pair of resonant circuits;
- 8           c)    providing a current responsive to the sum of the  
9 currents in the two legs of the differential Colpitts  
10 oscillator;
- 11          d)    alternately switching the current of c) to each of  
12 the two resonant circuits responsive to the voltage across  
13 the respective inductive load, the voltage between the

14 resonant circuits being a differential signal having a  
15 component at three times the fundamental frequency.

1       7. An oscillator and frequency tripler comprising:  
2       a differential Colpitts oscillator operating into an  
3 inductive load in each leg of the differential oscillator to  
4 provide differential fundamental frequency signals;  
5       a pair of resonant circuits;  
6       current circuitry providing a current responsive to the  
7 sum of the currents in the two legs of the differential  
8 oscillator; and  
9       switches alternately switching the current of the  
10 current circuitry to each of the two resonant circuits  
11 responsive to the voltage across the respective inductive  
12 load, the voltage between the resonant circuits being a  
13 differential signal having a component at three times the  
14 fundamental frequency.